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December 15, 2003

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Signature

**PATENT**

#02-0418-UNI  
Case #F7659(V)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Latza et al.  
Serial No.: 10/603,344  
Filed: June 25, 2003  
For: PASTA COMPOSITIONS

Edgewater, New Jersey 07020  
December 15, 2003

**SUBMISSION OF PRIORITY DOCUMENT**

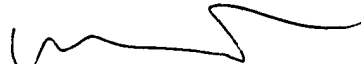
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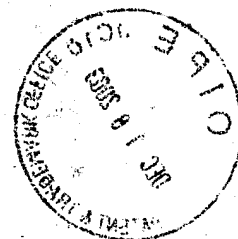
Pursuant to rule 55(b) of the Rules of Practice in Patent Cases, Applicant(s) is/are submitting herewith a certified copy of the European Application No. 02077644.9 filed July 3, 2002, upon which the claim for priority under 35 U.S.C. § 119 was made in the United States.

It is respectfully requested that the priority document be made part of the file history.

Respectfully submitted,

  
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**Attestation**

Die angehefteten Unterlagen stimmen mit der ursprünglich eingereichten Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.

The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

**Patentanmeldung Nr.    Patent application No.    Demande de brevet n°**

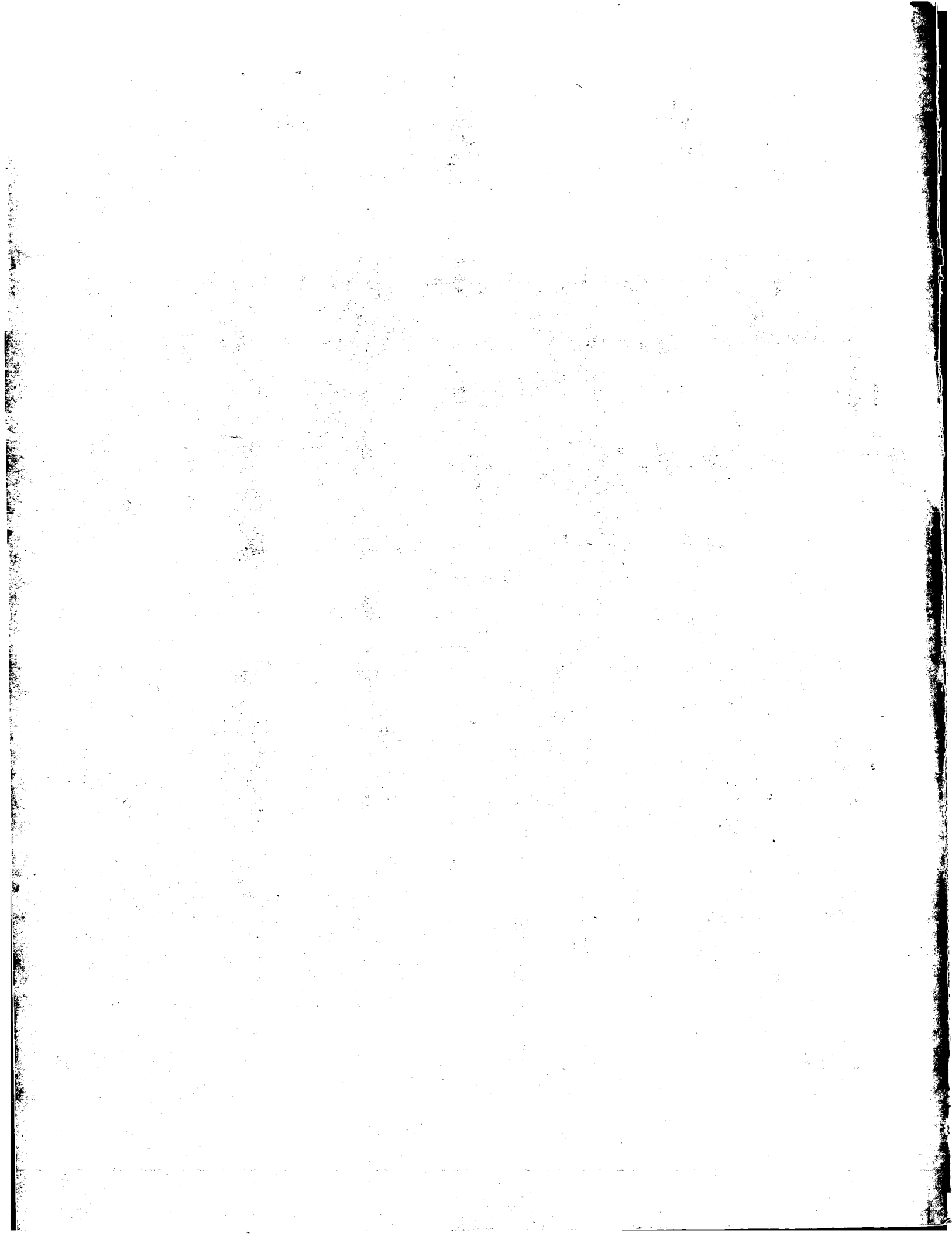
**02077644.9**

Der Präsident des Europäischen Patentamts;  
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets  
p.o.

**R C van Dijk**





Anmeldung Nr:  
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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:  
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.  
If no title is shown please refer to the description.  
Si aucun titre n'est indiqué se référer à la description.)

Pasta compositions

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**PASTA COMPOSITIONS**

(96)

**Field of the invention**

The present invention relates to pasta products with novel physical shape, and method(s) for  
5 preparing the same.

**Background of the invention**

Pasta products are well-known staple products, made from a variety of carbohydrate sources (usually wheat), and manufactured in a variety of physical shapes. Among such shapes are  
10 simple thin ropes of circular dimension (e.g. spaghetti), flat ropes/ribbon-like (e.g. tagliatelle), which are optionally curled up to nests, individual macaroni particles of various shapes, filled particles such as ravioli and fagottini, etcetera.

Many of such pasta products are used in snack foods, which are designed to be ready by  
15 soaking a few minutes in hot water, or cooking for a few minutes. Also, for non-snack applications quick-cooking pasta products are known. One of the problems with such pasta products is that the individual particles are limited in thickness, so as to ensure optimal rehydration and gelatinisation and heating as the products as sold are usually dehydrated and (partly) ungelatinised. Also, if quick-cooking filled dry pasta products are desired then a  
20 common problem is re-hydration of the filling material, which is completely surrounded by pasta dough material, which needs to rehydrate and pass water first, which does not go well for quick cooking pasta products.

There is a need for pasta products of substantial size, yet such that short cooking times are  
25 required (e.g. for instant or quick cooking varieties). Likewise, when pasta is used in applications with filling (e.g. ravioli, fagottini) it is desired that the content is also heated and rehydrated quickly. Furthermore, there is a continuous desire for known foods in new shapes.

US 5,693,351 (= EP439806, Nestlé) discloses filled (dried) pasta types which possess good  
30 rehydration, also of the filling. To this end, the particles are a pasta envelope prepared from 2 superposed leaves of pasta (or one folded double), in which a filling is introduced, after which the envelope is sealed around its periphery e.g. by crimping of the edges. The sealing is done such that an opening is provided in the seal. This may lead to e.g. ravioli type pasta, with an opening for good rehydration.

EP 970617 (Barilla) describes a method for producing filled pasta having improved rehydration. This is achieved by providing a piece of pasta sheet, provide a notch in the peripheral portion of the sheet, add a filling material, fold the pasta sheet to a pouch type object, seal the edges.

5

US 5,728,418 (= EP 717934) describes the preparation of a quick cooking pasta in helix shape. Although the pasta has a hole, it is not a filled product.

WO 93/25089 describes food products which consists of layers of parallel hollow tubes, similar  
10 as a honeycomb. It is disclosed pasta may be shaped like this, facilitating eating it with a sauce.

US 5,518,749 describes equipment and a method for extruding ready-to-eat cereals using a rotary die. The products that can be prepared using such equipment can have e.g. a braided  
15 appearance.

Various references disclose extrusion/shaping of dough for baked goods: US 4,536,147, WO 01/10227, US 6,036,990, US 5,874,120, US 5,492,706, or ice cream: US 4,913,645.

20 Similarly, US 5670185 describes rotary die equipment for extruding edible substances, such as ice cream. Various shapes can be produced using such equipment, such as twisted articles, with or without filling. Of the products disclosed, the extruded strands with filling are single stranded items, the multi-stranded twisted products are unfilled.

25 Equipment for producing extrudates of twisted material (e.g. dough) are also disclosed in US 4,445,838 and US 4,288,463, e.g. for producing pretzels.

### Summary of the invention

It has now been found that the above objective may be met (at least to some extent) by an  
30 edible product of which at least part is formed by a network of pasta, wherein the network comprises open space divided by filamentous elements of pasta. Such pasta networks may extend over considerable distances, and still have individual parts which are sufficiently thin for quick cooking purposes. Preferably, the filamentous elements are interlocking, interconnecting, interwoven, or a mixture of such techniques.

35



The invention further relates to an edible product of which part is formed by a network of pasta, wherein the network comprises filamentous elements of pasta and which network partially covers a filling material.

- 5 When applied for making filled pasta, the holes in the network may allow quick access of water to the filling, which is suitable for quick rehydration in dry applications and quick cooking in applications where the filling needs to be exposed to hot/boiling water for sufficient time.

- 10 Preferably, the network in the product according to the invention has a regular repeating pattern. This can suitably be formed by having at least filamentous elements of pasta which filamentous elements are interlocking, interconnecting, or interwoven. This may lead to various structures, such as e.g. web-like surfaces or structures. It is preferred that the network of pasta according to the invention is substantially continuous. Filamentous elements or strands are herein to be understood to be parts of pasta having a round, oval or rope-like  
15 structure or a flat, ribbon-like structure. Such structures are e.g. obtainable by extrusion. Although the word rope or ribbon suggests a certain length (like spaghetti) the filamentous elements can be short, e.g. 0.5 mm- 10 mm.

- A network can be seen as a combination of open space divided by the network material (here:  
20 pasta). Regarding the networks which are part of the products according to this invention, the ratio of pasta : open space in the pasta network per square unit is between 1:10 and 5:1, preferably between 1:6 and 3:1, when the pasta is dry, ambient stable.

- The networks according to the invention may suitably be prepared by techniques known in the  
25 art of textile processing, plastic processing, but also food processing applications such as are used for cereals, pretzels, cookies, pastries, etcetera. Examples of such techniques are weaving, knitting the filamentous elements, or by extruding or pressing the whole network (or parts thereof).

- 30 The products according to the invention may suitably be prepared by a process for preparing an edible product comprising pasta, the process comprising at least the steps of:
- preparing at least two filamentous elements (a) and (b) of pasta,
  - intermittently joining the filamentous elements (a) and (b) to form a substantially continuous network by weaving, knitting, tying, braiding, twisting, spinning, knotting,

interlocking, interconnecting, interweaving, web extrusion or combinations of such techniques,

- optionally cutting the resulting product.

In the above, it may be preferred that the preparation of the filamentous elements of pasta (a)  
5 and (b) is obtained by extrusion.

In the above, to obtain the network it is preferred that for extrusion a die is used having multiple openings, and although some holes may be stationary, it is also preferred that at least part of the holes are moved in a continuous (e.g. by rotating part or all of the die) or repetitive  
10 (e.g. where one part of the die moves back and forth) movement.

The particles so-obtained may be described as braids, ropes, knitwork, or similar, with filamentous elements of pasta (pasta threads or strands) as the basic material to form the braids, ropes, knitwork, webs, or similar.

15

Without wishing to be bound by theory, it is thought that the specific structure of the pasta material according to the invention is such that pasta particles can be prepared which (to the eye) have a large size or thickness, whilst the structure is such that the surface area per weight is high enough to ensure quick cooking and/or rehydration and/or gelation times. Such  
20 structures can be described as pasta articles having macropores.

The pasta according to the invention can be made into various types of products, e.g. ambient stable pasta, chilled stable pasta, frozen pasta, quick-cooking pasta, or instant pasta.

## 25 **Detailed description of the invention**

In the product according to the invention, the pasta can suitably be a conventional pasta. Such a pasta may be prepared from dough which may comprise (as wt% as calculated upon shaping into the network according to the invention):

- starch source 35 - 85%, preferably 55 - 75%
- 30 - protein 0 - 15%
- salt 0.01-5%
- water 15 - 65%, preferably 25 - 45%

In the above the starch source may preferably be flour or semolina. The protein may be part of  
35 the starch source, e.g. if flour is used as starch source the gluten in the flour can be part of the

protein for the products according to the invention. Optionally, other components like whole egg, hydrocolloids, fibres, emulsifiers, colorants, herbs and spices may be present.

In the compositions according to the invention the amount of fats/oils is preferably below 15%,  
5 and more preferably below 5% (as wt% as calculated upon shaping into the network according to the invention). Upon preparation for consumption this amount of fat can change, e.g. (but not exclusively) for a product known as ramen noodle. Ramen noodle is subjected to a (deep)frying step, and thus takes up fat. The amount of mono- and disaccharides is preferably below 5% wt. The flour or semolina are preferably obtained from wheat. It may be preferred  
10 that the pasta consists essentially of: flour, or semolina, salt, water, egg (whole, whites, or yolk).

As mentioned above, the pasta network preferably comprises filamentous elements of pasta (i.e. threads or strands). Suitably, such filamentous elements may have a length of at least 2  
15 mm and/or a diameter of at least 0.3 (preferably at least 0.6) mm (upon shaping into the network according to the invention).

Although the product according to the invention may be used for fresh or chilled stable products or frozen products, the advantages of using the network pasta are most noticeable in  
20 dry pasta. Such dry pasta will usually have a water content of 1 to 15 %wt. The pasta may be quick-cooking pasta, or instant pasta. In case of the pasta being dry, it usually needs to be rehydrated in an aqueous medium with application of heat, before consumption.

The pasta networks according to the invention may be in particular suitable for preparing filled  
25 pasta products, in particular of the quick cooking or instant type. In such case, the edible product according to the invention comprises a filling covered by the network of pasta. In this, said filling may comprise meat, cheese, egg, starch, vegetable matter, flavours, herbs, spices, bread crumbs, potato granules, fat, or mixtures thereof. In the case a filling is used in the products according to the invention that may be achieved by a process in which the edible  
30 filling material is introduced after the formation of the network. Also, simultaneous formation of the pasta network and assembly with the filling material is possible. The filling material may be formed/shaped and optionally combined with the pasta network by (co)extrusion filling and pasta network, or by wrapping the pasta network around the filling material.

Reason why the technique according to the invention is very suitable for filled quick cooking and instant pasta is that the holes or macropores may allow rehydration/contacting with hot water of the filling material, which is difficult for filled pasta which do not have macropores. Furthermore, it was found that depending upon the size of the holes, they may control water uptake by the filling, in a way that the pasta may swell upon rehydration and thus block the holes after a predetermined water uptake.

Another advantage of the pasta networks according to the present invention in combination with a filling is that upon purchase and when starting preparation the filling material is visible by the consumer through the macropores of the network. This is in particular an advantage for dry, shelf stable or instant pasta, fresh, chilled pasta but also frozen pasta.

#### EXAMPLE

15 A conventional pasta dough was prepared having the following composition:

1000 g durum wheat semolina

26 g whole egg powder

350g water.

This dough was kneaded and prepared in a conventional way.

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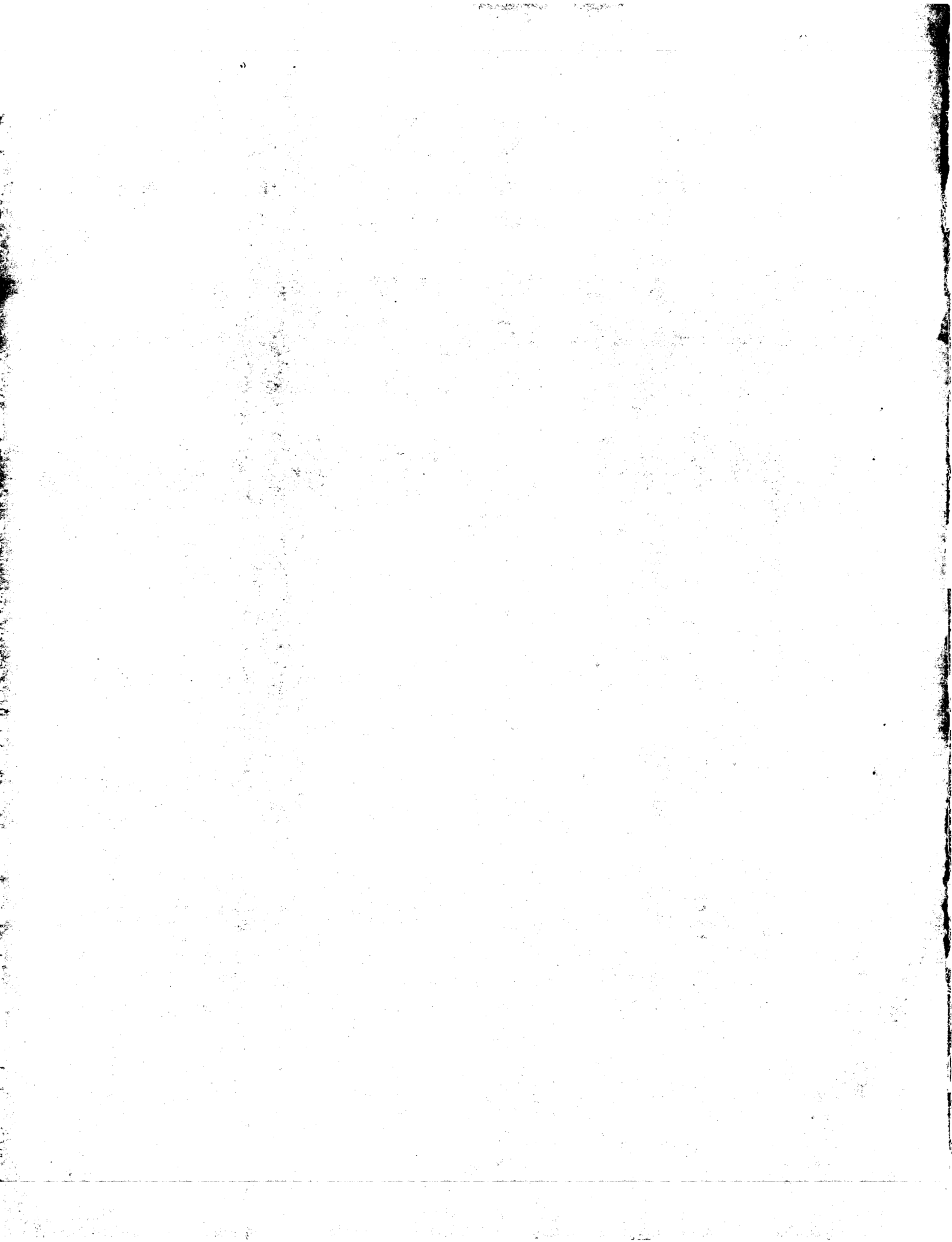
Said pasta dough was extruded using a rotary die, as is exemplified in figure 1 (upper picture: counter-rotating concentric elements). The extrusion nozzles are located partly in the inner ring of the die, partly on the outer ring. By counter-rotating the nozzle holes of inner and outer ring alternately join or separate when in operation. Such extrusion dies are known from the plastic industry to form plastic nets or weavings. If this used whilst extruding a pasta dough, a network of pasta will be formed, in which thread-like elements will alternately join and separate, thus forming a network. This network is shown in the picture on the right-hand side of figure 1. Optionally such network may be cut to the desired shape and size. Such network may be used as such or used for covering a filling material, thus forming a filled pasta element with macropores.

**CLAIMS**

1. Edible product of which at least part is formed by a network of pasta, wherein the network comprises open space divided by filamentous elements of pasta.
2. Edible product of which part is formed by a network of pasta, wherein the network comprises filamentous elements of pasta and which network partially covers a filling material.
3. Product according to claim 1-2, wherein the network has a regular repeating pattern.
4. Product according to claim 1-3, wherein the network is substantially continuous over the whole element.
5. Product according to claim 1-4, wherein the filamentous elements of pasta are interlocking, interconnecting, or interwoven.
6. Product according to claim 1-5, wherein the ratio of pasta : open space in the pasta network is between 1:10 and 5:1, preferably between 1:6 and 3:1.
7. Product according to claim 1-6, wherein the network is a web.
8. Product according to claim 1-7, which network can be produced by weaving, knitting, extruding, pressing.
9. Product according to claim 1-8, wherein the pasta comprises (as wt% as calculated upon shaping into the network according to the invention):
  - starch source 35 - 85%, preferably 55 - 75%
  - protein 0 - 15%
  - salt 0.01-5%
  - water 15 - 65%, preferably 25 - 45%.
10. Product according to claim 9, wherein the starch source comprises flour or semolina.

11. Product according to claim 10, wherein the flour or semolina is obtained from wheat.
12. Product according to claim 1-11, wherein the pasta has a water content of 1 to 15 %wt.
13. Product according to claim 1-12, wherein the filamentous element have a length of at least 2 mm and/or a diameter of at least 0.3 (preferably at least 0.6) mm.
14. Product according to claim 1-13, wherein the pasta is rehydratable and should be heated in aqueous medium before consumption.
15. Product according to claim 1-14, comprising a filling covered by the network of pasta, said filling comprising meat, cheese, egg, starch, vegetable matter, flavours, herbs, spices, bread crumbs, potato granules, fat, or mixtures thereof.
16. Product according to claim 14, wherein the filling material is visible to the consumer prior to and/or upon preparation.
17. Process for preparing an edible product comprising pasta, the process comprising at least the steps of:
  - preparing at least two filamentous elements (a) and (b) of pasta,
  - intermittently joining the filamentous elements (a) and (b) to form a substantially continuous network by weaving, knitting, tying, braiding, twisting, spinning, knotting, interlocking, interconnecting, interweaving, web extrusion or combinations of such techniques,
  - optionally cutting the resulting product.
18. Process according to claim 17, wherein the preparation of the two filamentous elements of pasta is by extrusion.
19. Process according to claim 17-18, wherein an edible filling material is introduced after the formation of the network.

20. Process according to claim 17-19, further comprising the step of (co)extrusion filling and pasta network or wrapping the pasta network around the filling material.





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# **ABSTRACT**

Pasta products having novel shape and methods for preparing the same. In particular, networks of pasta can be prepared, which may be used for filled pasta.



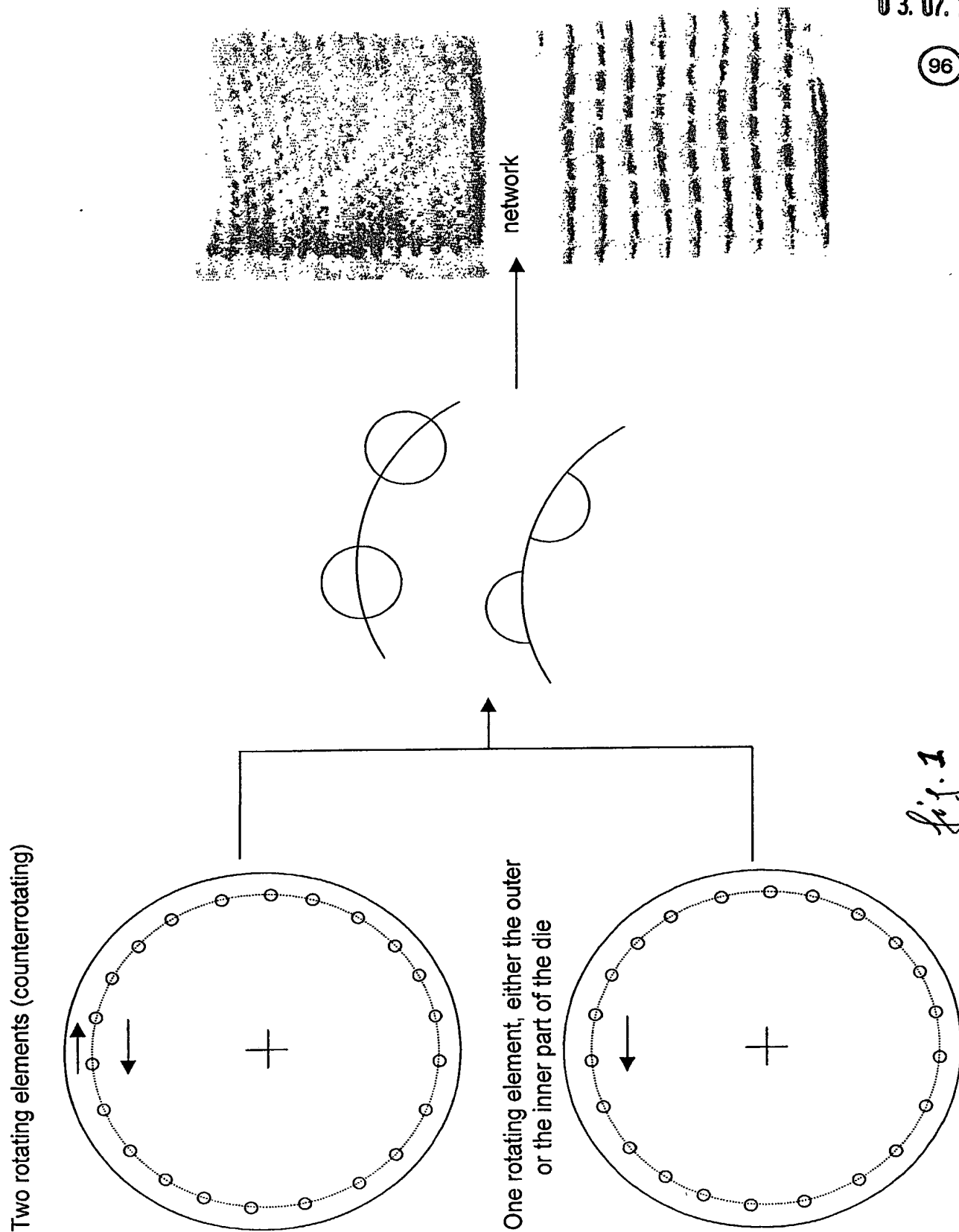


fig. 1

